

## 4. Descriptions of New Fossorial Wasps from Australia.

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The species described in this paper were mostly collected by me on a recent expedition to Australia; a few have been received from the Queensland and West Australian Museums.

## Family THYNNIDÆ.

*ZASPILOTHYNNUS UNIPUNCTATUS*, sp. n. (Pl. I. figs. 1, 2.)

♂. Niger; clypeo linea angusta apicali utrinque, maculaque mediana albo-flavidulis; alis subhyalinis, venis fuscis; mandibulis macula basali flava; femoribus anticis intermediisque apice, posticis omnino, tibiis tarsisque ferrugineis.

♀. Nigra; mandibulis pygidioque fusco-ferrugineis; segmento dorsali primo oblique striato, secundo circa decies transverse striato; pygidio elongato-ovato, longitudinaliter striato.

Long., ♂ 15 mm.; ♀ 10 mm.

\* For explanation of the Plate see p. 69.

♂. Clypeus strongly convex at the base, obliquely depressed towards the apex, closely punctured, the apical margin broadly truncate. Head closely punctured, the interantennal prominence very broad, feebly rounded at the apex, divided by a longitudinal carina which is continued to the base of the clypeus. Thorax closely punctured; the anterior angles of the pronotum not produced; median segment as long as broad, rounded, with two parallel longitudinal grooves on the posterior slope. Abdomen elongate, closely and shallowly punctured, the segments very slightly constricted at the base; seventh dorsal segment longitudinally striated, produced at the apex into a flat subtriangular lamella. Hypopygium linguiform, without an apical spine, obliquely striated above, the basal angles produced into blunt teeth. Sixth ventral segment with a spine on each side at the apical angles. Claspers truncate at the apex, with a fringe of long hairs. Second abscissa of the radius a little shorter than the third, second recurrent nervure received just beyond one-third from the base of the third cubital cell. Pubescence on the head and dorsulum pale fulvous, whitish elsewhere.

♀. Clypeus punctured - rugose, without a carina. Head shining, with a few scattered punctures, subrectangular, nearly half as broad again as long, rounded at the posterior angles, the front coarsely punctured. Pronotum broader than the head, nearly twice as broad as long, opaque and shallowly punctured; the anterior margin very shallowly emarginate, with a few large setigerous punctures. Scutellum and median segment shining, sparsely and finely punctured; the scutellum broader than long, broadly rounded at the apex, dorsal surface of the median segment shorter than the scutellum. Abdomen shining, sparsely punctured; first dorsal segment closely obliquely striated; second with about ten transverse carinae gradually decreasing in height from the apex to the base, the basal ones low and not very distinct. Fifth ventral segment longitudinally striated; pygidial area elongate-ovate, longitudinally striated, the striae converging at the base. Intermediate tibiae dilated, basal joint of intermediate tarsi moderately broadened.

*Hab.* Yallingup, S.W. Australia; October to December. ♂ ♀ in cop.

This is nearest to *Z. dilatatus* Sm., from which the male differs in the sculpture and colour of the clypeus, in the distinctly coarser puncturation, and in the position of the second recurrent nervure, which is received further from the base of the cell than in *dilatatus*. The female differs conspicuously from *dilatatus* in the sculpture of the first dorsal segment and in the shape of the pygidium; in the former character it approaches *carbonarius* Sm., but the pygidium is not constricted at the base in either this species or *dilatatus*. It is remarkable that although *dilatatus* is one of the commonest species about Perth in December, I did not take it at Yallingup, whereas I secured a good series of males of the present species, though not many females. This species

has not yet been taken at Perth. Mr. Giles took *dilatatus* on *Leptospermum* blossom, which the present species does not seem to frequent, most of my specimens having been taken on the wing, or resting on Eucalyptus leaves.

There is no tubercle at the base of the second ventral segment of the male as there is in *dilatatus*, and the mesopleuræ of the female do not show a small dorsal surface as in that species.

*ZASPILOTHYNNUS DILATATUS* Sm., subsp. *SPICULIFER*, nov.

A pair received by me from Southern Cross, W. Australia.

The male differs from Perth specimens in having a short but distinct apical spine on the hypopygium, and black legs.

♀. Nigra, mandibulis fusco-ferrugineis; segmento dorsali primo punctato, secundo transverse circa 12-carinato; tibiis intermediis incrassatis.

Long. 12 mm.

♀. Head subrectangular, more than half as broad again as long; shining, sparsely punctured. Pronotum broader than the head, sparsely and finely punctured, the anterior margin very shallowly emarginate, with a row of large punctures, from each of which springs a long hair. Mesopleuræ showing a very small dorsal surface on each side at the basal angles of the scutellum. First dorsal segment punctured, with a transverse groove before the recurved apical margin; second dorsal segment with about twelve transverse carinæ, all low, except the two nearest the apex, the basal carinæ very low and indistinct. Pygidium not constricted at the base, obliquely truncate posteriorly, with arched carinæ at the base and on the basal portion of the surface of the truncation which is broadly ovate. Fifth ventral segment obliquely striated.

*Hab.* Southern Cross, W. Australia. ♂ ♀ in cop.

This is in both sexes very near *Z. dilatatus* Sm., but the male differs in the presence of an apical spine on the hypopygium and in the colour of the legs; the female in the sculpture of the basal dorsal segment and of the fifth ventral segment, in *dilatatus* the former is finely transversely striated, with punctures between the striæ, the latter longitudinally striated instead of obliquely as in the present form, in which also the striæ on the first dorsal segment are obsolete leaving only the punctures.

This species is remarkable in showing a small dorsal surface of the mesopleuræ on each side at the base of the scutellum. This point is one of the chief characters of the subfamily Rhagigasterinæ, in which, however, it is much more strongly developed.

*ZASPILOTHYNNUS RUGICOLLIS*, sp. n. (Pl. I. figs. 3, 4.)

♂. Niger; rugosus; albopilosus; abdomine punctato; pronoto angulis anticis acute producto: alis subhyalinis, venis nigris.

♀. Rufo-ferruginea; abdomine nigro; segmento dorsali primo transverse rugoso, apice transverse carinato, segmento dorsali

secundo transverse decem carinato, area pygidiali longitudinaliter striato; antennis nigris.

Long., ♂ 18 mm.; ♀ 11 mm.

♂. Head broad, distinctly broader than the pronotum; clypeus convex, narrowly truncate at the apex. Eyes separated at the base of the antennæ by a distance equal to nearly three times the length of the scape; the interantennal prominence very broad, strongly recurved at the sides, almost transverse at the apex and divided by a low longitudinal carina. Head and thorax coarsely rugose; the anterior angles of the pronotum acutely produced; scutellum almost flat. Median segment broader than long, strongly sloped, and closely punctured, the sides clothed with long white pubescence. Abdomen elongate, shallowly punctured, the segments slightly constricted at the base; sixth ventral segment with a spine on each side at the apical angles; seventh dorsal segment not produced into a lamella, coarsely striated, the striae rounded towards the apex. Hypopygium triangular, with a strong apical spine, the basal angles produced into broad rounded teeth. Second abscissa of the radius about equal to the third, second recurrent nerve received at two-fifths from the base of the third cubital cell. Hind tibiæ spinose.

♀. Clypeus convex, without a carina; head subrectangular, rounded at the posterior angles, nearly half as broad again as long, distinctly convex, with fine scattered punctures. Pronotum twice as broad as long, sparsely punctured, the anterior margin straight, with a transverse row of large punctures each bearing a long hair. Scutellum much broader than long; median segment broad, no longer than the scutellum, the two combined no longer than the pronotum. Abdomen finely and closely punctured; first dorsal segment transversely rugose, with an apical transverse carina; second dorsal segment with ten transverse carinae, the two apical carinae stronger and further apart than the others. Sixth dorsal segment about twice as long as broad, the sides parallel till near the apex, when they converge sharply, the apex produced into a point, the ventral plate extending beyond the dorsal and broadly rounded. Fifth ventral segment coarsely longitudinally striated. The pygidium is not constricted at the base.

*Hab.* Yallingup, S.W. Australia; November. Capel River, S.W. Australia. ♂ ♀ in cop.

This species differs from most of the genus, in the male sex by the absence of the flat lamella on the seventh dorsal segment, and in the female by the shape of the pygidium which is not narrowed at the base. The hind and intermediate tibiæ of the female are much broadened and strongly spinose, but the basal joint of the intermediate tarsi is not broadened. In both sexes the species is closely related to *Z. nigripes* Guér., differing in the male by the larger head, coarser sculpture, and acute angles of the pronotum; in the female by the colour of the median segment and the different shape of the pygidium.

*POGONOTHYNNUS FULVOHIRTUS*, sp. n. (Pl. I. figs. 5, 6.)

♂. Niger, albopilosus; thorace supra fulvohirto; mandibulis, clypeo, lineaque pone oculos flavis; alis hyalinis, leviter infuscatis, venis fuscis.

♀. Nigra; mandibulis fusco-ferrugineis; flagello fusco; pedibus obscure fusco-ferrugineis; segmento dorsali secundo transverse sex-carinato; segmento sexto contracto, apice late truncato.

Long., ♂ 20 mm.; ♀ 12 mm.

♂. Clypeus moderately convex, very broadly truncate at the apex; antennæ as long as the head, thorax, and median segment combined, the interantennal prominence rounded at the apex and connected by a carina with the base of the clypeus. Head rugosely punctured, thinly covered above with fulvous pubescence; thorax closely and more finely punctured, the dorsal surface thickly covered with long fulvous pubescence. Median segment covered with long whitish pubescence, rounded, broader than long. Abdomen shallowly punctured, the sides almost parallel, except at the extremities; sixth ventral segment with a short spine on each side at the apical angles; hypopygium broad at the base, with a strong tooth on each side at the basal angles, thence the sides converge sharply and are produced into a process longer than broad, the sides of which diverge slightly towards the apex, which is truncate at the base of the long and slightly recurved apical spine. Second and third abscissæ of the radius almost equal, second recurrent nerve received at one-fourth from the base of the third cubital cell.

♀. Clypeus without a carina; head shining, with scattered punctures, nearly twice as broad as long, very strongly rounded posteriorly. Thorax shining, with scattered punctures; the pronotum nearly twice as broad as long, widely emarginate anteriorly, with a row of punctures on the anterior margin, from each of which springs a long hair; scutellum broader than long. Median segment very short, not more than half as long as the scutellum. First dorsal segment strongly punctured at the base, with one or two indistinct transverse striæ before the strongly raised apical margin; second dorsal segment with six strong transverse carinæ, third and fourth segments very sparsely punctured. Pygidium contracted at the base, then obliquely truncate, the surface of the truncation ovate, the dorsal plate covering only two-thirds of the surface of the truncation and broadly truncate at the apex, two arched carinæ at the base of the truncation. Fifth ventral segment coarsely obliquely striated. Intermediate tibiæ very stout; basal joint of intermediate tarsi moderately broadened.

*Hab.* Yallingup, S.W. Australia; October to December.

This is near *P. morosus* Sm., from which the male differs in the colour of the pubescence on the head and thorax and the slightly narrower process of the hypopygium. In both species the seventh dorsal segment is produced into a flat rugulose lamella. The female of *morosus* is unknown, but the female of the closely

allied *walkeri* Turn. differs in the deeply emarginate apex of the dorsal plate of the pygidium. These three species are very closely allied and probably do not occur together. The only other species of *Pogonothynnus* which I took at Yallingup was *fenestratus* Sm., of which I obtained two males and a female. In one male the process of the hypopygium is narrower than in Perth specimens, in the other much broader, showing that too much importance must not be attached to small variations in the shape of the hypopygium.

CAMPYLOTHYNNUS LUNDYÆ, sp. n. (Pl. I. figs. 17, 18.)

♂. Flavus; mandibulis apice, antennis, vertice fascia lata inter oculos, antice per ocellos posticos ad basin antennarum producta, fascia sub-ocello antico, pronoto fascia angusta transversa, mesonoto fasciis tribus longitudinalibus, scutello segmentoque mediano fascia angusta longitudinali, mesosterno, segmentis dorsalibus ventralibusque linea longitudinali mediana, tibiis supra, tarsisque intermediis posticisque nigris; alis hyalinis, venis nigris.

♀. Flava; mandibulis, fronte inter oculos; segmentis dorsalibus primo secundoque fascia transversa apicali, tertio, quarto quintoque linea apicali in media dilatata, maculaque basali utrinque, pygidio, femoribus supra, tarsisque posticis nigris.

Long., ♂ 23 mm.; ♀ 14 mm.

♂. Closely punctured, more finely on the abdomen than on the thorax. Interantennal prominence very broadly rounded at the apex, connected by a short carina with the base of the clypeus, which is very broadly truncate at the apex. Pronotum rather strongly produced at the anterior angles but not forming tubercles. Apex of the scutellum raised above the level of the postscutellum. Abdomen elongate, the sides nearly parallel; seventh dorsal segment not flattened or produced into a lamella; hypopygium with a spine on each side at the basal angles, thence narrowly produced with converging sides and ending in a long apical spine. The second transverse cubital nervure is nearer to the second than to the first recurrent nervure.

♀. Head shining, broader than long, very sparsely punctured, with a short longitudinal frontal sulcus, three large punctures apparently indicating the position of the ocelli. Thorax very sparsely punctured; pronotum twice as broad as long, with a row of deep punctures along the anterior margin; dorsal surface of the median segment no longer than the scutellum. First dorsal segment with a transverse carina at the apex, with a broad groove before the carina; second dorsal segment with three strong carinæ, which are separated by a very broad furrow from the apical carina. Pygidium shining at the base, constricted and marked with several arched carinæ at the base of the oblique posterior truncation, the surface of which is elongate ovate; the ventral plate slightly broadened and rounded beyond the apex of the dorsal plate. Fifth ventral segment coarsely longitudinally

striated. Intermediate tibiæ swollen, basal joint of intermediate tarsi not broadened. A tuft of golden hairs on each side of the pygidium.

*Hab.* Cunderdin, W. Australia, 80 miles east of Perth (*Mrs. Lundy*). December to January. ♂ ♀ in cop.

Closely allied to *C. assimilis* Sm., from which the male differs in the shape of the interantennal prominence, which is pointed in *assimilis*, in the more prominent angles of the pronotum and in the narrower hypopygium, as well as in the much greater extent of the yellow colour. On the abdomen the colour is light orange rather than yellow.

The female differs from *assimilis* (described by Smith as *flavo-fasciatus*) in the greater extent of the yellow colour, in the much greater width of the furrow before the apical carina of the second dorsal segment, and in the same difference on the first dorsal segment. The form of the pygidium is almost identical in the two species. *C. assimilis* occurs at Perth and also at Southern Cross, Cunderdin being about halfway between the two localities, so that this is not likely to be merely a subspecies.

#### ELIDOTHYNNUS FUMATIPENNIS, sp. n.

♂. Niger; mandibulis, apice excepto, clypeo, margine inferiore oculorum angustissime usque ad basin antennarum, lineaque pone oculos flavis; alis fuscis, apice subhyalinis.

♀. Nigra, albopilosa; capite nitido, pygidio pilis longissimis instructo; mandibulis fusco-ferrugineis.

Long., ♂ 26 mm.; ♀ 12 mm.

♂. Clypeus broadly truncate at the apex; interantennal prominence almost pointed at the apex, connected by a carina with the base of the clypeus; head and thorax closely punctured, scutellum and abdomen rather more sparsely punctured, median segment very closely and finely punctured. Prothorax produced into acute angles at the sides; median segment short and broad, thinly clothed with white pubescence; sides of the abdomen almost parallel. Seventh dorsal segment with curved striæ, not produced into a lamella; hypopygium triangular, with an apical spine, the basal angles produced into strong blunt teeth. Second abscissa of the radius as long as the third, second and first recurrent nervures received at almost equal distances from the second transverse cubital nervure.

♀. Head fully half as broad again as long, very slightly convex, with a few large punctures on the front, the remainder of the head shining, with a few scattered punctures. Thorax and median segment sparsely punctured and thinly clothed with long white hairs; the pronotum nearly twice as broad as long, very slightly narrowed posteriorly; scutellum broad, no longer than the dorsal surface of the median segment. Basal half of the first abdominal segment raised above the apical portion and deeply emarginate in the middle posteriorly, sparsely punctured

at the base and thinly clothed with long white hairs, delicately transversely aciculate on the depressed apical portion. Second dorsal segment with three strong transverse carinae at the base, the apical half transversely striated; third and fourth dorsal segments closely punctured and clothed with long pubescence at the base, smooth at the apex; fifth dorsal segment closely punctured. Fifth ventral segment coarsely longitudinally striated. Pygidium strongly compressed at the base, the surface of the apical truncation narrowly elongate ovate, a dense tuft of pale fulvous hairs springing from each side near the base.

*Hab.* Cunderdin, W. Australia (*Mrs. Lundy*). December and January. ♂ ♀ in cop.

This is very near *E. tuberculifrons* Sm., but may be distinguished in the male by the large size, the fuscous wings, the acute angles on the sides of the prothorax, and the broader hypopygium; in the female by the much sparser puncturation of the head and thorax, and the straight instead of arched division between the punctured and smooth areas on the third dorsal segment.

#### THYNNOIDES FUSCOCOSTALIS Turn.

*Thynnoides fuscocostalis* Turn. Ann. & Mag. Nat. Hist. (8) x. p. 540 (1912), ♂ ♀.

Further specimens of this species show that the female often has the legs ferruginous.

#### BELOTHYNNUS NOVELLUS, sp. n.

♂. Niger; mandibulis basi, clypeo margine apicali, maculaque utrinque, lineaque obliqua utrinque inter antennas flavis; femoribus, tibiis tarsisque ferrugineis; alis subhyalinis, venis fuscis; segmento ventrali primo apice tuberculato.

♀. Ferruginea; abdomine nigro; segmento dorsali primo transverse sex-carinato; pygidio contracto, longitudinaliter striato, basi utrinque fasciculato.

Long., ♂ 18 mm.; ♀ 14 mm.

♂. Clypeus obliquely depressed from near the base, broadly truncate at the apex; the interantennal prominence broadly rounded at the apex; antennae slightly narrowed at the apex, a little longer than the thorax and median segment combined. Head, thorax, and median segment very finely and closely punctured; anterior margin of the pronotum very shallowly and widely emarginate. Abdomen elongate, the sides nearly parallel, more sparsely punctured than the thorax, the segments slightly constricted at the base; seventh dorsal segment rugose at the apex; first ventral segment with a strong longitudinal carina, produced into a tubercle at the apex; hypopygium with a blunt tooth on each side at the base, thence produced in an elongate triangular form to the base of the apical spine. Third abscissa of the radius a little longer than the second, first recurrent nervure received nearer to the second transverse cubital nervure



than the second, which is received beyond one-third from the base of the third cubital cell.

♀. Clypeus very short, transverse, without a carina. Head rather large, more than half as broad again as long, with a distinct frontal sulcus, subopaque, with a few scattered punctures, strongly rounded at the posterior angles. Thorax and median segment sparsely punctured; the pronotum nearly twice as broad as long, rectangular, with a row of large punctures along the anterior margin; scutellum very broad, as long as the dorsal surface of the median segment. Abdomen very finely and closely punctured; the first dorsal segment with a shallow transverse groove before the apical margin; second dorsal segment with six strong transverse carinae; fifth ventral segment longitudinally rugose. Pygidium elongate, nearly four times as long as broad, the sides nearly parallel, rounded at the apex, finely longitudinally striated, smooth at the apex. Intermediate tibiae moderately swollen; basal joint of intermediate tarsi spinose, but not broadened.

*Hab.* Brisbane (*Hacker*). September. From the Queensland Museum.

This is nearer to *B. binghami* Turn. than to any other species, but is quite distinct. The hypopygium is broader than in *impetuosus* Sm.

#### LOPHOCHEILUS MAMILLATUS TURN.

*Thynnus (Lophocheilus) mamillatus* Turn. Proc. Linn. Soc. N.S.W. xxxiii. p. 171 (1908), ♂.

♀. Nigra: mandibulis, pedibus, segmento ventrali quinto, pygidioque ferrugineis; antennis fuscis: segmento dorsali secundo transverse sex-carinato.

Long. 9–11 mm.

♀. Clypeus without a carina, transverse at the apex; head twice as broad as long, rounded at the posterior angles, smooth and shining, with a short but distinct frontal sulcus, a few scattered punctures on the front. Thorax shining, with a few small scattered punctures; pronotum half as broad again as long, with a row of deep punctures along the anterior margin; dorsal surface of the median segment shorter than the scutellum, with large scattered punctures. First dorsal segment very sparsely punctured, with a deep transverse groove before the raised apical margin; second segment with six transverse carinae, a deep, broad, transverse groove before the apical carina; third and fourth segments very minutely punctured, with sparse large punctures intermingled; fifth dorsal segment more coarsely punctured in the middle, almost smooth at the base and apex. Fifth ventral segment longitudinally rugose-striate. Sixth dorsal segment longitudinally striated, smooth at the extreme apex, about three times as long as the basal and twice as long as the

apical breadth, broadly rounded at the apex, the sides divergent from the base.

*Hab.* Yallingup, S.W. Australia; November and December. ♂ ♀ in cop. Fremantle (type ♂).

The nearest species to this is *L. leviceps* Sm., the male of which has a similar tubercle at the base of the second ventral segment, but in that species the apical segments are black in both sexes and the hypopygium of the male and pygidium of the female are different in shape.

*LOPHOCHEILUS LEVICEPS* Sm.

*Thynnus leviceps* Sm. Cat. Hym. B. M. vii. p. 44 (1859), ♀.

♂. Niger, albopilosus; alis hyalinis, venis nigris, segmento ventrali secundo basi tuberculato, clypeo apice transverse albo-lineato.

♀. Nigra; mandibulis pygidioque apice fusco-ferrugineis; segmento dorsali secundo irregulariter septem-carinato.

Long., ♂ 20 mm.; ♀ 11 mm.

♂. Clypeus closely punctured, with a longitudinal carina at the base, truncate rather narrowly at the apex; interantennal prominence broad, bilobed at the apex. Head and thorax closely and rather finely punctured. Median segment very minutely punctured with large sparse punctures intermixed, thinly clothed with long white hairs. Abdomen finely and shallowly punctured, the segments slightly constricted at the base; seventh dorsal segment broadly subtruncate at the apex, irregularly longitudinally rugose-striate. First ventral segment with a strong longitudinal carina, deeply separated from the second, which has a strong tubercle at the base. Hypopygium strongly prominent at the basal angles, thence triangular to the base of the strong apical spine. Second abscissa of the radius nearly half as long again as the third; first and second recurrent nervures received at about the same distance from the second transverse cubital nervure.

♀. Head about half as broad again as long, very strongly rounded at the posterior angles, smooth and shining, with a distinct frontal sulcus. Thorax shining; a row of large punctures along the anterior margin of the pronotum, which is nearly twice as broad as long. Median segment coarsely punctured, nearly as long as the scutellum. Abdomen shining, with a few scattered punctures; first dorsal segment with a deep transverse groove before the raised apical margin; second dorsal segment with about seven transverse carinæ, the two at the apex and the basal one high and regular, those intermediate lower and broken. Fifth ventral segment rugose. Pygidium more than twice as long as broad, the sides parallel, rounded at the apex, longitudinally striated, smooth at the apex.

*Hab.* Yallingup, S.W. Australia; December. ♂ ♀ in cop.

This is nearest to *L. mamillatus* Turn., as noticed under that

species. Smith described the female only from a specimen collected on the west coast of Australia.

*LOPHOCHELLUS RUBROCAUDATUS*, sp. n. (Pl. I. figs. 7, 8.)

♂. Niger, fulvopilosus; mandibulis, clypeo margine apicali, maculaque parva utrinque inter antennis flavis; segmentis abdominalibus sexto septimoque, femoribus intermediis apice, posticis dimidio apicali, tibiis tarsisque rufo-ferrugineis; alis hyalinis, venis fuscis, stigmate ferrugineo.

♀. Nigra; segmentis quinto sextoque rufo-ferrugineis; mandibulis, antennis, tibiis tarsisque ferrugineis; segmento dorsali secundo transverse septem-carinato.

Long., ♂ 14-16 mm.; ♀ 10-12 mm.

♂. Clypeus closely punctured, with a distinct longitudinal carina, rather narrowly truncate at the apex; interantennal carina almost transverse, not very strongly developed. Head, thorax, and median segment finely and closely punctured; the pubescence on the head and dorsal surface of the thorax fulvous, on the pleuræ and median segment whitish. Abdomen shining and more sparsely punctured, feebly fusiform, the segments constricted at the base, seventh dorsal segment with strong curved striae. Hypopygium elongate triangular, produced into an apical spine, the basal angles produced, forming rounded teeth. Second abscissa of the radius a little longer than the third; first and second recurrent nervures received at an almost equal distance from the second transverse cubital nervure.

♀. Clypeus without a carina, transverse at the apex. Head nearly twice as broad as long, very strongly rounded at the posterior angles, shining, with a few scattered punctures and a short shallow frontal sulcus. Pronotum much narrower than the head, nearly twice as broad as long, very finely and closely punctured, with a row of large setigerous punctures along the anterior margin. Median segment sparsely punctured, the dorsal surface as long as the scutellum. First dorsal segment coarsely but sparsely punctured, with a deep transverse groove before the raised apical margin; second dorsal segment with seven transverse carinae, the two apical carinae higher than the rest and with a broader and deeper groove between them; third and fourth dorsal segments microscopically punctured, with larger punctures intermingled; fifth dorsal segment smooth at the base, punctured at the apex. Fifth ventral segment longitudinally rugose-striate. Sixth dorsal segment oblique, the sides parallel, rounded at the apex, nearly three times as long as broad, longitudinally striated, smooth at the apex.

*Hab.* Yallingup, S.W. Australia; September to November.

♂ ♀ in cop.

The fore coxæ of the male are slightly concave.

This may be distinguished from *L. mamillatus* Turn., which occurs in the same district, and is very similar in size and colour

of the abdomen, by the absence of a tubercle at the base of the second ventral segment, by the yellow clypeus and mandibles and ferruginous legs in the male, and by the red colour of the fifth dorsal segment, the presence of seven (instead of six) carinae on the second dorsal segment, the longer and narrower pygidium, and the puncturation of the thorax in the female.

ENCOPOTHYNNUS, gen. nov.

♂. Pronotum widely emarginate anteriorly; abdominal segments strongly constricted at the base; ventral segments 3-6 with a spine on each side at the apical angles, dorsal segments 2-5 with a spine on each side at the apical angles; hypopygium very broad, broader than long, the sides parallel, the apical margin narrowly emarginate near the middle on each side of the short apical spine; maxillae strongly bearded.

♀. Clypeus convex, without a carina; pronotum much longer than broad, with a median sulcus; second abdominal segment without carinae, the sculpture not differing from the other segments; fifth dorsal segment with a longitudinal carina; sixth segment compressed laterally, the dorsal plate obliquely depressed, very narrow, slightly broadened to the apex.

This genus is somewhat allied to *Doratithynnus*, but may be distinguished by the spines on the dorsal segments of the male, and by the undifferentiated second dorsal segment of the female. In most of the allied genera, such as *Tmesothynnus* and *Acanthothynnus*, the maxillae of the male are strongly bearded.

Type of the genus, *E. spinulosus*.

ENCOPOTHYNNUS SPINULOSUS, sp. n. (Pl. I. figs. 9, 10.)

♂. Rufo-ferruginea; sterno, postscutello, segmento mediano, coxis, trochanteribus, femoribus, tarsis intermediis et posticis, tibiis intermediis supra posticisque totis, mandibulis macula basali alba, antennisque nigris; clypeo margine anteriore, pronoto linea angusta transversa antice, tegulis basi, postscutelloque linea angusta transversa albis; alis hyalinis, venis fuscis.

♀. Nigra; capite, prothorace, scutello pygidioque rufo-ferrugineis; tibiis tarsisque fusco-ferrugineis.

Long., ♂ 8-10 mm.; ♀ 3-7 mm.

♂. Clypeus broad, very slightly convex, not much produced, and narrowly truncate at the apex. Antennae of almost even thickness throughout, short, shorter than the thorax and median segment combined; interantennal prominence obsolete. Head and thorax sparsely but not finely punctured; pronotum as broad as the head, widely emarginate anteriorly; median segment rounded, finely and closely punctured. Abdomen narrower than the thorax, the segments strongly constricted at the base, the sides not parallel, the third segment the broadest; dorsal segments 2-5 with a small spine on each side at the apical angles, those on

segments 2-4 white; ventral segments 3-6 with a spine on each side at the apical angles; all the segments coarsely punctured; seventh dorsal segment rather broadly truncate at the apex. Hypopygium much broader than long, the sides parallel, rounded at the apical angles, the apical margin strongly but rather narrowly emarginate on each side of the short apical spine. Second abscissa of the radius about twice as long as the third; second recurrent nerve received at about one-tenth from the base of the third cubital cell.

♀. Head smooth and shining, as long as the greatest breadth, nearly twice as broad in front as on the hind margin; mandibles falcate. Pronotum nearly half as long again as broad, the sides almost parallel, a sulcus from the anterior margin reaching beyond the middle, smooth and shining, with a row of large punctures on the anterior margin, from each of which springs a long hair. Scutellum small, strongly narrowed to the apex; dorsal surface of the median segment twice as long as the scutellum, sparsely punctured. Abdominal segments very minutely and closely punctured; a small, narrow, raised area on each side at the base of the five basal dorsal segments; fifth segment longitudinally carinated in the middle; sixth segment compressed laterally, the dorsal surface oblique, very narrow, slightly broadened towards the apex. Fifth ventral segment sparsely punctured.

*Hab.* Kalamunda, Darling Ranges, S.W. Australia, 850 ft.; February to April. ♂ ♀ in cop.

Taken in considerable numbers on Eucalyptus blossom.

#### GYMNOTHYXNUS CARISSIMUS, sp. n.

♂. Niger; mandibulis, apice excepto, clypeo linea longitudinali nigra, linea obliqua utrinque inter antennas, pronoto margine anteriore et posteriore, mesopleuris maculis duabus, mesonoto linea longitudinali, scutello macula mediana, maculaque utrinque angulis anticis, postscutello linea transversa, segmentisque dorsalibus 1-6, ventralibusque 2-5 fascia interrupta apicali albido-flavis; femoribus, tibiis tarsisque ferrugineis; alis hyalinis, venis nigris, stigmatè pallide ferrugineo.

♀. Nigra; tibiis tarsisque bruno-testaceis; segmentis abdominalibus apice lateribusque luteo-testaceis, pygidio pallide ferrugineo; pronoto plano; segmento dorsali secundo basi transverse bicarinato.

Long., ♂ 9-11 mm.; ♀ 4-6 mm.

♂. Clypeus produced and rather narrowly truncate at the apex; interantennal prominence broad; antennæ scarcely as long as the thorax and median segment combined, tapering slightly towards the apex. Pronotum short, the anterior margin almost straight; head and thorax finely and closely punctured, opaque; scutellum shining and very strongly convex; median segment rounded, finely and closely punctured. Abdominal segments moderately constricted at the base, shining and very sparsely

punctured; seventh dorsal segment very broadly truncate at the apex; hypopygium truncate at the apex, with a strong apical spine. Second abscissa of the radius more than half as long again as the third; first recurrent nervure received beyond two-thirds from the base of the second cubital cell, second at about one-eighth from the base of the third cubital cell.

♀. Head as long as the greatest breadth, strongly narrowed posteriorly; a broad, shallow depression on each side, with a shallow frontal sulcus, smooth. Pronotum smooth, opaque, a little longer than broad, slightly narrowed posteriorly; scutellum transverse, broader than long; dorsal surface of the median segment no longer than the scutellum, shining, with a few scattered punctures. First dorsal segment broadly depressed at the apex, the raised basal portion strongly bilobed; second dorsal segment with two strong transverse carinae near the base, the apical margin also raised; third and fourth segments narrowly depressed at the apex. Pygidium very narrow, the dorsal plate sharply narrowed into a point at the apex, the ventral plate notched at the apex; a tuft of pale golden hairs on each side.

*Hab.* Kalamunda, Darling Ranges, S.W. Australia; March and April. Perth; February. ♂ ♀ in cop.

This is related to *G. lesouefi* Turn., especially in the male sex, but the shape of the head and thorax and the sculpture of the abdomen of the female are very different. The flattened pronotum of the female seems to be characteristic of this genus.

GYMNOTHYNNUS (?) MUCRONATUS, sp. n. (Pl. I. figs. 15, 16.)

♂. Niger: mandibulis, clypeo margine apicali, pronoto margine anteriore, tegulis basi, scutello macula mediana, postscutelloque linea transversa pallide flavis; alis hyalinis, venis nigris, stigmatibus fusco-ferrugineo; hypopygio trilobato, loba apicali elongata, mucronata.

♀. Fusco-nigra; segmentis abdominalibus apice late luteo-testaceis; pygidio pallide ferrugineo, crinito; segmento dorsali secundo haud transverse carinato, dimidio apicali valde depresso.

Long., ♂ 7 mm.; ♀ 5 mm.

♂. Clypeus produced and narrowly truncate at the apex; interantennal prominence obsolete; antennae shorter than the thorax and median segment combined, of almost even thickness throughout; head closely punctured, the clypeus smooth and flattened. Thorax rather closely punctured; median segment smooth and shining at the base. Abdomen fusiform, the segments strongly constricted at the base, smooth and shining, the two apical segments closely punctured. The head, sides of the abdomen and thorax clothed with long whitish hairs. Hypopygium trilobed, the lateral lobes not very strongly developed, the median lobe much longer than the lateral, nearly twice as long as broad and rounded at the apex, without an apical spine. Second abscissa of the radius more than half as long again as the third;

first recurrent nervure received just beyond two-thirds from the base of the second cubital cell, second at about one-tenth from the base of the third cubital cell.

♀. Head shining, very sparsely punctured, a little longer than the greatest breadth, narrowed posteriorly, not convex, without a frontal sulcus. Thorax much narrower than the head; the pronotum longer than broad, slightly narrowed posteriorly, with a median sulcus on the anterior half, slightly raised posteriorly and subtuberculate; scutellum very small, subtriangular; dorsal surface of the median segment shorter than the scutellum. Dorsal segments of the abdomen very broadly depressed at the apex, the raised basal portion bilobed, second segment without transverse carinæ. Pygidium arched, narrow, lanceolate, the sides densely clothed with long pale fulvous hairs, which also cover the fifth ventral segment.

*Hab.* Cunderdin, W. Australia: February to March (*Mrs. Lundy*). ♂ ♀ in cop.

This little species is not very near typical *Gymnothynnus*, and can only be placed provisionally in the genus. The form of the male hypopygium is singular; and though the sculpture of the abdomen and form of the pygidium of the female are very near *G. trianguliceps* Turn., the form of the head and pronotum differ very greatly. That species and *lesoqufi* Turn. are most nearly related to the present species, and none of them is very near typical *Gymnothynnus*. *G. carissimus*, described above, seems to form a link connecting them with the typical species.

#### ASPIDOTHYNNUS FOSSULATUS, sp. n.

♂. Niger; mandibulis, apice excepto, clypeo linea marginali utrinque, macula minuta utrinque inter basin antennarum, pronoto margine anteriore in medio interrupto, tegulis, scutello linea abbreviata longitudinali, postscutello linea transversa, mesopleuris macula parva sub alis, segmentisque dorsalibus 2-4 macula transversa utrinque flavidulis; pronoto margine posteriore late luteo; femoribus anticis dimidio apicali, tibiis anticis tarsisque ferrugineis; alis hyalinis, venis fuscis.

♀. Fusco-ferruginea; thorace, segmentisque dorsalibus tertio quartoque dimidio apicali nigris; capite utrinque concave depresso; segmento dorsali secundo transverse quadricarinato, pronoto angulis anticis tuberculatis.

Long., ♂ 10 mm.; ♀ 6 mm.

♂. Clypeus convex, longer than broad, with a longitudinal carina, rather broadly truncate at the apex, the anterior angles rounded; interantennal prominence very feebly developed; antennæ about as long as the thorax and median segment combined, of almost even thickness throughout. Head long and narrow, closely and finely punctured, thorax more finely and sparsely punctured; anterior margin of the pronotum straight; scutellum strongly convex. Abdomen elongate fusiform, the

segments strongly constricted at the base; seventh dorsal segment broadly truncate at the apex; hypopygium short, very broadly rounded at the apex, with a slender apical spine. Second abscissa of the radius a little longer than the third; second recurrent nervure received by the third cubital cell at a distance from the base equal to one-quarter of the length of the second transverse cubital nervure.

♀. Clypeus convex, but not carinate. Head a little longer than broad, subrectangular, shining, with a few scattered punctures, with a strong longitudinal median ridge, on each side of which is a large concave depression. Pronotum broader than long, very slightly narrowed posteriorly, sparsely and finely punctured, the anterior angles distinctly tuberculate; scutellum broader than long, broadly rounded at the apex; dorsal surface of the median segment very short, not so long as the scutellum, the posterior slope oblique. First dorsal segment with the apical half depressed, the apex of the raised basal half strongly emarginate; second dorsal segment with four well marked transverse carinæ; segments 3-5 smooth at the base, sparsely but rather deeply punctured at the apex. Pygidium very narrowly elongate ovate, compressed into a narrow carina at the base. Tibiæ thickened, the basal joint of the intermediate tarsi slender, not broadened. Tarsal ungues simple, not bidentate.

*Hab.* Yallingup, S.W. Australia; ♂ ♀ in cop., January 6th, 1914. Busselton, S.W. Australia; 11 ♂ ♂, January 24-27, 1914.

This is the first female of the group to be described.

The male is very near *A. combustus* Sm., but in that species the abdomen is ferruginous. I am inclined to think that *fossulatus* may prove to be only a local form of *combustus*, but it is quite possible that the female may show stronger differences. *A. combustus* is from Adelaide, though the type appears to have been taken on the west coast.

#### ASTHENOTHYNNUS VICARIUS, sp. n.

♂. Niger; mandibulis basi, macula obliqua utrinque inter antennis, linea late interrupta pone oculos, vertice macula utrinque, pronoto margine anteriore et posteriore, tegulis basi, mesopleuris maculis duabus parvis, mesonoto macula quadrata, scutello macula mediana, postscutello linea transversa, segmentisque dorsalibus 2-6 macula obliqua utrinque flavis; femoribus, tibiis tarsisque ferrugineis; alis hyalinis, venis fuscis, stigmatibus bruno-testaceo; hypopygio linguiforme.

♀. Fusca; pedibus bruneis, tarsis testaceis; segmentis dorsalibus primo, tertio quartoque apice testaceis; segmento secundo bruno-testaceo, sexto ferrugineo.

Long., ♂ 5-7 mm.; ♀ 3-4 mm.

♂. Clypeus convex, with a low carina from the base not reaching the apex, strongly produced in the middle and narrowly truncate at the apex. Antennæ shorter than the thorax and



median segment combined, of almost even thickness throughout, the interantennal prominence pointed at the apex. Head closely punctured; thorax shining, very sparsely punctured. Median segment rounded, shining, very minutely punctured, smooth at the base. Abdomen fusiform, flattened, the third segment the broadest; hypopygium narrowly linguiform, without an apical spine. Second abscissa of the radius equal to the third; first recurrent nervure received at two-thirds from the base of the second cubital cell second just before one-quarter from the base of the third cubital cell.

♀. Head shining, with a few scattered punctures, without a frontal sulcus, nearly twice as broad anteriorly as long, narrowed posteriorly and rounded at the posterior angles, much broader than the thorax. Pronotum narrow, without a median sulcus, a little broader anteriorly than long, slightly narrowed posteriorly, finely punctured; scutellum very small and narrow; dorsal surface of the median segment scarcely as long as the scutellum, shining and sparsely punctured, the posterior truncation oblique. First dorsal segment broadly depressed at the apex, the raised portion broadly emarginate posteriorly; second segment with two strongly raised transverse carinae in addition to the less strongly raised apical margin; segments 3-5 with a raised area on each side strongly curved. Pygidium lanceolate. Basal joint of intermediate tarsi slender, not spinose.

*Hab.* Yallingup, S.W. Australia; November. ♂ ♀ in cop.

Allied to *A. pygmaeus* Turn. both in the shape of the clypeus and hypopygium. These species are not very near typical *Asthenothynnus*, but seem to form a link between that genus and *Zelebora*. The female of *pygmaeus* is unknown. The male of the present species is less strongly punctured than *pygmaeus*, has a longer clypeus and a shorter third cubital cell, in addition to colour differences. *A. deductor* Turn. is also closely allied.

#### ASTHENOTHYNNUS LILLIPUTIANUS, sp. n.

♂. Niger; mandibulis basi, clypeo margine apicali angustissime, linea obliqua utrinque inter antennis, pronoto marginibus late interruptis, postscutello linea transversa, segmentisque dorsalibus secundo, tertio quartoque macula utrinque albidoflavis; alis hyalinis, venis nigris, stigmatibus bruno-ferrugineis; hypopygio anguste linguiforme.

♀. Nigra; segmento dorsali secundo ferrugineo, transverse bicarinato, margine apicali insuper reflexo; pygidio pallide ferrugineo; segmentis dorsalibus apice anguste testaceis.

Long., ♂ 4-5 mm.; ♀ 3 mm.

♂. Clypeus produced and narrowly truncate at the apex; interantennal prominence not much developed, almost transverse at the apex; antennae scarcely as long as the thorax and median segment combined, the apical joints very feebly arcuate beneath. Head and thorax very finely and closely punctured. Median

segment rounded, shining, very minutely punctured. Abdomen flattened fusiform, shining; the dorsal segments very narrowly depressed at the apex. Hypopygium narrowly linguiform, without an apical spine. Second abscissa of the radius a little longer than the third; first recurrent nervure received at about two-thirds from the base of the second cubital cell, second at about one-quarter from the base of the third cubital cell.

♀. Head smooth and shining, much broader anteriorly than long, narrowed posteriorly, slightly convex; thorax much narrower than the head; the pronotum a little broader anteriorly than long, slightly narrowed posteriorly, with a longitudinal depression on each side reaching from near the anterior angles to more than halfway to the posterior margin; scutellum narrow; dorsal surface of the median segment a little longer than the scutellum, sparsely punctured. First dorsal segment broadly depressed at the apex, the raised basal portion widely emarginate posteriorly; second dorsal segment with two strong transverse carinae near the base, the apical margin also raised; third and fourth segments narrowly depressed on the apical margin. Pygidium narrow, the sides almost parallel.

*Hab.* Yallingup, S.W. Australia; November. ♂ ♀ in cop.

Allied to *A. vicarius* described above, but may easily be distinguished by the black legs of the male and the lateral depressions on the pronotum of the female.

#### ASTHENOTHYNNUS PLEURALIS, sp. n.

♂. Niger; mandibulis macula basali, clypeo margine apicali, linea obliqua utrinque inter antennis, pronoto margine anteriore et posteriore, mesonoto macula apicali, scutello linea longitudinali, postscutello linea transversa, mesopleuris maculis duabus, segmento mediano macula apicali utrinque, segmentisque dorsalibus 1-5 macula transversa laterali utrinque albido-flavis; vertice macula utrinque fusco-ferruginea; alis hyalinis, venis nigris; hypopygio rotundato, spina minuta apicali.

♀. Fusca: segmento dorsali secundo, pygidio, tarsisque bruno-ferrugineis; pronoto late longitudinaliter sulcato, segmento dorsali secundo transverse quadri-carinato.

Long., ♂ 9-10 mm.; ♀ 4-5 mm.

♂. Clypeus produced and narrowly truncate at the apex; interantennal prominence very feebly developed; antennae scarcely longer than the thorax and median segment combined, tapering slightly towards the apex; head and thorax finely and very closely punctured; scutellum strongly convex, subcarinate longitudinally in the middle; median segment short, much broader than long. Abdomen flattened, shining and almost smooth, the two apical segments rather coarsely punctured. Hypopygium broadly rounded, as broad at the base as long, with a short apical spine. Second abscissa of the radius longer than the third; first recurrent nervure received at two-thirds from

the base of the second cubital cell, second at about one-sixth from the base of the third cubital cell.

♀. Head smooth and shining, slightly convex, a little longer than the greatest breadth, slightly narrowed posteriorly, with a short frontal sulcus. Thorax much narrower than the head; the pronotum nearly as long as broad, the sides almost parallel, with a very broad and deep longitudinal groove dividing the segment; scutellum narrow, longer than broad, pointed at the base; dorsal surface of median segment as long as the scutellum. Dorsal segments of the abdomen narrowly depressed at the apex, second segment with four transverse carinæ. Pygidium lanceolate, very narrow.

*Hab.* Yallingup, S.W. Australia; November. Kalamunda, S.W. Australia; February to April. ♂ ♀ in cop. The female is the type.

The male is extremely near *A. beatrix* Turn., and is only distinguished from that species by the rather shorter antennæ, the more convex and subcarinate scutellum, and by the somewhat different yellow markings, which however are subject to considerable variation. The female, on the other hand, is easily distinguished from that of *beatrix* by the broad groove on the pronotum and the longer and narrower head.

The males in this genus and in *Zeleboria* are often extremely near each other, and the species are not always easy to divide in that sex.

#### AGRIOMYIA SUSPICIOSA Sm.

*Thynnus suspiciosus* Sm. Descr. n. sp. Hymen. p. 161 (1879), ♂.

*Thynnus teniolatus* Frogg. Trans. Roy. Soc. S. Australia, xvi, p. 71 (1893), ♂.

I have seen the type of *teniolatus* in the South Australian Museum.

#### NEOZELEBORIA ALEXANDRI, sp. n.

♂. Niger; abdomine ferrugineo, segmento primo dimidio basali nigro; femoribus, tibiis, tarsisque ferrugineis; vertice macula utrinque fusco-ferruginea; mandibulis, clypeo margine apicali late, tegulis, scutello macula magna mediana, postscutelloque fascia transversa flavis; alis hyalinis, venis nigris.

♀. Nigra; pedibus ferrugineis, coxis nigris; mandibulis basi, clypeo, antennisque subtus fusco-ferrugineis; capite utrinque late excavato; segmento dorsali secundo transverse quadricarinato.

Long., ♂ 13-16 mm.; ♀ 7 mm.

♂. Clypeus produced and rather broadly truncate at the apex; interantennal prominence bilobed; antennæ as long as the head, thorax and median segment combined, the apical joints slightly arcuate beneath. Head and mesonotum finely granulate and clothed sparsely with long fulvous pubescence, pleuræ thickly

clothed with grey pubescence; scutellum and median segment very closely punctured. Abdomen elongate, shallowly punctured; seventh dorsal segment truncate at the apex. Hypopygium gradually narrowed to the apex, where it is narrowly truncate, with a strong apical spine. Second abscissa of the radius longer than the third; first recurrent nervure received at two-thirds from the base of the second cubital cell, second at one-fifth from the base of the third cubital cell. A tuft of pale hairs on each side at the base of the hypopygium.

♀. Clypeus without a carina. Head shining, sparsely punctured, broader anteriorly than long, narrowed posteriorly, the hind margin not as broad as the head is long; a rather deep and large depression on each side of the head between the eyes and the base of the antennæ; the head somewhat compressed at the sides. Thorax much narrower than the head; pronotum closely punctured, half as broad again anteriorly as long, narrowed posteriorly, with a longitudinal sulcus; scutellum sparsely punctured, narrowed towards the apex. Median segment very finely and closely punctured, the dorsal surface a little longer than the scutellum. First dorsal segment with a broad transverse groove before the apex, second with four strong transverse carinæ; the other segments shining, very sparsely punctured. Pygidium constricted at the base, the surface of the posterior truncation ovate. Tarsi slender.

*Hab.* Cunderdin, W. Australia (*Mrs. Lundy*); July and August.

The male is rather near *volatilis* Sm., but the sculpture is coarser, the details of neuration rather different, and the scutellum has a yellow spot. The females of the two species are very distinct.

#### PSAMMOTHYNNUS RUBRICANS, sp. n.

♂. Niger; clypeo margine apicali, mandibulis basi, pronoto margine anteriore linea transversa utrinque, scutello postscutelloque macula parva mediana flavis; pronoto margine posteriore late tegulisque luteis; segmentis abdominalibus primo apice secundoque fusco-ferrugineis, secundo tertioque macula obliqua laterali flavidula; femoribus, tibiis tarsisque ferrugineis.

Long. 8.5 mm.

♂. Clypeus convex, broadly rounded at the apex, with a carina from the base not reaching the apex. Head, thorax, and median segment closely punctured, the head more coarsely, the median segment very finely; interantennal prominence almost pointed at the apex; the five apical joints of the flagellum arcuate beneath. Abdomen fusiform, shining, sparsely and very shallowly punctured; hypopygium small, emarginate at the apex, with a small spine on each side at the angles of the emargination; some long curved hairs springing from beneath the seventh dorsal segment. Third abscissa of the radius slightly longer than the

second; the third cubital cell receiving the second recurrent nerve at a distance from the base equal to about one-fourth of the length of the second transverse cubital nerve.

*Hab.* Yallingup, S.W. Australia; September.

In addition to colour, the rounded apex of the clypeus separates this from other species of the genus.

*PHYMATOTHYNNUS TONSORIUS*, sp. n. (Pl. I. figs. 11, 12.)

♂. Niger, fulvopilosus; mandibulis, apice excepto, clypeo margine anteriore, pronoto fascia arcuata et margine anteriore anguste, tegulis, postscutelloque macula parva flavis; femoribus, tibiis tarsisque ferrugineis; clypeo apice bidentato; hypopygio linguiforme.

♀. Fusco-ferruginea: mandibulis, flagello, femoribus, tibiis tarsisque bruneo-testaceis; scutello compresso, subtuberculato; segmento mediano obliquo, angulis anticis subtuberculatis.

Long., ♂ 13-17 mm.; ♀ 8-9 mm.

♂. Clypeus not much produced, strongly bidentate on the middle of the apical margin; the interantennal prominence only represented by tubercles at the base of the antennæ; apical joints of the antennæ strongly arcuate beneath. Head, thorax, and median segment opaque, closely and rather finely punctured; pubescence fulvous on the head and thorax, whitish on the median segment and sides of the abdomen. First abdominal segment slender, broadened from the base, longer than the second, with a sulcus from the base reaching beyond the middle; abdomen shining, sparsely and very shallowly punctured, flattened, elongate; the seventh dorsal segment and the apex of the sixth rugose. Hypopygium linguiform, without spines. Wings hyaline, faintly tinged with yellow; second and third abscissæ of the radius about equal; second recurrent nerve further than the first from the second transverse cubital nerve.

♀. Clypeus with a carina; the front deeply emarginate anteriorly and subtuberculate at the base of the antennæ, with a short frontal sulcus. Head shining, with scattered punctures, nearly twice as broad as long, strongly rounded posteriorly. Thorax and median segment very finely punctured; the pronotum more than half as broad again as long, depressed at the anterior angles, the anterior margin distinctly carinate between the depressions; scutellum strongly compressed and subtuberculate. Median segment oblique, the anterior angles subtuberculate. Abdomen finely and closely punctured; first dorsal segment narrowly depressed at the apex; second transversely rugulose between two transverse carinæ, the apical margin raised, with a deep groove before it. Pygidium entire, almost vertical, broadly ovate, longitudinally rugulose. Fifth ventral segment punctured rugose.

*Hab.* Yallingup, S.W. Australia; September to November.

♂ ♀ in cop.

This is related to *P. nitidus* Sm., but the male may be easily distinguished by the colouring and the bidentate clypeus; the female by the compressed and subtuberculate scutellum, the somewhat similar tubercle in *nitidus* being on the base of the median segment. These two species form a group rather distinct from *P. monilicornis*, the type of the genus.

The male of this species was attracted at Yallingup in large numbers to hair lotion, the chief ingredient of which was oil of bergamot.

PHYMATOTHYNNUS PYGIDIOPHORUS, sp. n. (Pl. I. figs. 13, 14.)

♂. Niger, albopilosus; alis hyalinis, venis nigris: hypopygio truncato, angulis apicalibus brevissime dentatis, spina apicali magna, incrassata.

♀. Nigra, antennis pygidioque fusco-ferrugineis; capite thoraceque nonnunquam ferrugineis; segmento dorsali sexto basi constricto, lateribus marginato.

Long., ♂ 10 mm.; ♀ 5-6 mm.

♂. Clypeus with a carina, produced and narrowly truncate at the apex; interantennal prominence strongly developed, broadly rounded at the apex; antennæ with the apical joints strongly arcuate beneath. Head rather broad, coarsely rugose. Thorax deeply but not very closely punctured; the pronotum with the anterior angles slightly prominent; median segment rounded, finely and closely punctured. Abdomen shining, the punctures almost obsolete, subfusiform, the first segment slender at the base; seventh dorsal segment punctured-rugose. Hypopygium broad, with parallel sides, short, broadly truncate at the apex, the apical angles produced into short, delicate spines, the apical spine very stout and long. Second abscissa of the radius distinctly longer than the third; first recurrent nervure received nearly half as far again as the second from the second transverse cubital nervure, the second recurrent received at about one-fifth from the base of the third cubital cell.

♀. Head subrectangular, half as broad again as long, rounded at the posterior angles, rather closely punctured, the clypeus without a carina, the front with a short sulcus and produced into small tubercles at the base of the antennæ. Pronotum a little longer than broad, sparsely punctured. Scutellum broader than long, no longer than the dorsal surface of the median segment. Abdomen closely and finely punctured; first dorsal segment with a transverse groove before the apical margin; second transversely rugulose between two transverse carinæ, a broad transverse groove before the raised apical margin. Pygidium narrowed at the base, the sides margined from the base by divergent carinæ, broadly rounded at the apex.

*Hab.* Yallingup, S.W. Australia; September to November.

♂ ♀ in cop.

The male is rather near *P. monilicornis* Sm., but the hypopygium

is much larger and broader; the female, however, differs in the shape of the head and most notably in the shape of the pygidium, which, unlike typical *Phymatohynnus*, is narrowed at the base and margined.

*TACHYNOMYIA MACULIVENTRIS*, sp. n.

♂. Niger, albopilosus; mandibulis, apice excepto, clypeo margine apicali et in medio, macula parva utrinque inter antennis, pronoto fascia arcuata, scutello postscutelloque macula parva mediana, segmentis dorsalibus 2-6 macula magna laterali utrinque, ventralibusque 2-6 fascia lata vix interrupta flavis; femoribus, tibiis, tarsis, segmentoque ventrali septimo ferrugineis; alis hyalinis, venis nigris; segmento ventrali primo acute tuberculato.

♂. Head finely rugose; thorax and median segment very closely punctured; abdomen shining, shallowly punctured. Clypeus without a carina; interantennal prominence bilobed; anterior margin of the pronotum broadly arched. First ventral segment with an acute tubercle at the apex, deeply separated from the second segment. Sides of the hypopygium parallel on the basal half, then strongly convergent to the base of the apical spine. The three apical joints of the maxillary palpi are longer than the others, but not very elongate. Second recurrent nerve received at about one-seventh from the base of the third cubital cell.

*Hab.* Cunderdin, W. Australia; September to October (*Mrs. Lundy*).

This species is easily distinguished from all others of the genus by the yellow markings of the abdomen, and the tubercle on the first ventral segment. The form of the hypopygium is very similar to that of *T. abdominalis* Guér.

*EIRONE ALBOCLYPEATA*, sp. n.

♂. Niger; clypeo macula apicali triangulari lineaque marginali utrinque, pronotoque margine anteriore linea transversa utrinque albis; alis hyalinis, iridescentibus, venis nigris.

♀. Rufo-ferruginea, nitida; abdomine nigro, segmento sexto ferrugineo; scutello latitudine duplo latiore.

Long., ♂ 8.5 mm.; ♀ 5.5 mm.

♂. Clypeus with a depressed, oblique, triangular truncation at the apex. Head rather broad, not convex, closely and rather strongly punctured; the four apical joints of the flagellum arcuate beneath. Thorax more finely punctured than the head; median segment rounded. Abdomen shining, closely and finely punctured; seventh dorsal segment with larger punctures, broadly rounded at the apex. Hypopygium rounded, ciliated.

♀. Head subrectangular, as broad as long, smooth and

shining. Pronotum longer than broad, emarginate posteriorly; scutellum about twice as long as broad, more than half as long as the pronotum; thorax and median segment smooth and shining, with a few scattered punctures. Median segment longer than the pronotum, much longer than broad, gradually broadened from the base. Abdomen elongate, subcylindrical, shining, sparsely and finely punctured, with a few larger elongate punctures. Pygidium with a broad median carina.

*Hab.* Yallingup, S.W. Australia; November. ♂ ♀ in cop.

The male is nearest to *E. vitripennis* Sm., but in that species the head is rather strongly convex posteriorly and much less strongly punctured. The female has the head broader than in *vitripennis*, the scutellum longer, and the whole insect more polished and less strongly punctured; there is also no longitudinal impressed mark on the dorsal segments.

#### EIRONE RUFODORSATA, sp. n.

♂. Niger; clypeo postscutelloque luteis; pronoto, mesonoto, scutello tegulisque ferrugineis; alis hyalinis, venis nigris.

Long. 9 mm.

♂. Clypeus almost flat, with a carina, the apical margin transverse; head and thorax finely and closely punctured; the front between the antennæ widely emarginate. Pronotum less closely punctured than the mesonotum, narrower than the head, the anterior margin transverse and slightly raised; scutellum narrowly rounded at the apex; median segment rounded, very finely punctured. Abdomen shining, shallowly punctured; hypopygium rounded and ciliated. Third abscissa of the radius a little longer than the second; first recurrent nervure received at the middle of the second cubital cell, second at about one-third from the base of the third cubital cell.

*Hab.* Herberton, N. Queensland (*Dodd*).

The colouring is quite different from that of any other species of the genus.

#### EIRONE FERRUGINEICORNIS TURN.

*Eirone ferrugineicornis* Turn. Proc. Zool. Soc. London, p. 265 (1910), ♂.

The type came from Hermannsburg in Central Australia. I took five males at Kalamunda, in the hills behind Perth, in February.

### Family SCOLIIDÆ.

#### Subfamily ANTHOBOSCINÆ.

#### ANTHOBOSCA CLYPEATA SM.

*Dimorphoptera clypeata* Sm. Trans. Ent. Soc. London, p. 240 (1868), ♀.



*Anthobosca clypeata* Turn. Proc. Linn. Soc. N.S. W. xxxii. p. 522 (1907).

This appears to be a most variable species as to colour. The type, said by Smith to come from Champion Bay, though it is labelled "Swan River," has the second, third, and fourth dorsal and second and third ventral segments broadly banded with ferruginous; specimens from the Warren River, S.W. Australia, are without the bands on the fourth dorsal and third ventral segments, but are undoubtedly of the same species. In the Australian Museum are specimens from Albany, W. A., collected by Masters, in which the thorax is richly variegated with yellow, and a form from Cunderdin in the West Australian Museum has the markings on the abdomen also yellow. Not having been able to compare these last two forms, I cannot be sure that they belong to the same species, though the neurulation agrees, both recurrent nervures being received by the second cubital cell. With the Warren River females in the South Australian Museum is a male closely resembling *A. crassicornis* Sm., but differing in having the abdomen black, with the two apical segments ferruginous, and the antennæ distinctly shorter and stouter than in the type. The latter difference must, I think, be specific, so that *crassicornis* cannot be the male of *clypeata*, though it must belong to a nearly related species.

ANTHOBOSCA FASTUOSA Sm.

*Dimorphoptera fastuosa* Sm. Trans. Ent. Soc. London, 1868, p. 240, ♀.

*Anthobosca fastuosa* Turn. Proc. Linn. Soc. N. S. W. xxxii. p. 521 (1907), ♀.

The type from Champion Bay has the three apical segments of the abdomen black. A specimen in Mr. Froggatt's collection from Southern Cross, W. A., has these segments ochraceous, so that the abdomen is all of one colour, giving the specimen a very strong resemblance to the female of *Scolia (Trielis) flavidula* Sm. This is probably only a colour variety, though it may possibly prove to be distinct.

Family PSAMMOCHARIDÆ.

CALOPOMPILUS XANTHOCROUS, sp. n.

♀. Niger; mandibulis apice, femoribus, tibiis tarsisque ferrugineis; alis flavis, fusco bivittatis, margine apicali insuper infuscatis.

Long. 7-10 mm.

♀. Mandibles bidentate; clypeus short, very broadly truncate at the apex; antennæ slender, second joint of the flagellum a little longer than the third, shorter than the third and first

combined; ocelli very close together, the posterior pair more than twice as far from the eyes as from each other. Scutellum a little longer than the length of the transverse groove at the base, broadly subtruncate at the apex. Median segment as long as broad, with a longitudinal sulcus from the base to the apex. Head opaque, thorax subopaque, abdomen shining; hind tibiæ feebly serrate, not spinose. Second abscissa of the radius shorter than the third, second cubital cell narrow; first recurrent nervure received close to the middle of the second cubital cell, second at one-third from the base of the third cubital cell. Cubitus of the hind wing originating just beyond the transverse median nervure.

*Hab.* Mt. Wellington, Tasmania, 2300 ft.; January to March.

Nearly allied to *C. alicie* Turn. from the same locality, the colouring of the wings and the position of the cubitus of the hind wing being the same in both species. In *aliciae* the antennæ are much shorter and stouter, the scutellum shorter and broader, the two basal abdominal segments more or less ferruginous, the third abscissa of the radius much shorter, being only about half as long as the second, and the hind tibiæ more distinctly serrate and slightly spinose.

From the position of the cubitus of the hind wing these two species would, according to Ashmead's table, fall into the genus *Hemipogonius* Sauss.; but this character is certainly not of generic importance, and I am inclined to think that Ashmead's name *Calopompilus* should sink. The comb of the fore tarsi is entirely absent in *aliciae* and *xanthochrous*, though a few very minute spines are visible with the lens. But among Australian species many intermediate forms are to be found, and I doubt if *Calopompilus* or *Hemipogonius* can be clearly separated from *Cryptocheilus*.

#### CALOPOMPILUS CONNECTENS, sp. n.

♀. Nigra; mandibulis, clypeo apice, antennis, articulis duobus apicalibus exceptis, femoribus, tibiis, tarsisque ferrugineis; alis flavo-hyalinis, fusco-bivittatis, margine apicali insuper infuscatis.

Long. 8 mm.

♀. Antennæ slender, the proportion of the joints as in *xanthochrous*, from which the species differs in the shorter scutellum, the absence of a sulcus on the median segment, the position of the first recurrent nervure, which is received distinctly before the middle of the second cubital cell, the shorter third abscissa of the radius, which is only equal to the second, and the colour of the antennæ, mandibles, and clypeus.

*Hab.* Mt. Wellington, Tasmania, 2300 ft.; January.

The hind tibiæ in this species are almost smooth, the serration being very feeble.

## CALOPOMPILUS AUROPILOSELLUS, sp. n.

♀. Nigra, aureo-sericea; mandibulis, clypeo apice, scapo subtus, flagello basi, tegulis, ano, pedibusque ferrugineis; alis flavis, nigro-trifasciatis.

♂. Feminæ similis; flagello nigro.

Long., ♀ 13 mm.; ♂ 11 mm.

♀. Clypeus broad and short, broadly subtruncate at the apex; labrum slightly exposed, subtruncate at the apex. Antennæ rather short and stout; second joint of the flagellum about as long as the first and third combined, third a little longer than the fourth. Eyes almost parallel on the inner margin; ocelli in a small triangle, the posterior pair twice as far from the eyes as from each other. Scutellum broadly subtruncate at the apex; median segment with a deep median sulcus. Abdomen subopaque, the second ventral segment with a distinct transverse groove near the base; pygidium broad. The whole insect more or less densely clothed with golden pubescence, most closely on the posterior margin of the pronotum, the pleuræ, the median segment, and the apical angles of the dorsal segments. Hind tibiæ spinose, distinctly serrate on the outer side. Second abscissa of the radius about equal to the third; first recurrent nervure received at two-fifths from the base of the second cubital cell, second at three-fifths from the base of the third cubital cell. Cubitus of the hind wing interstitial with the transverse median nervure. The black bands on the fore wing are broad and completely cross the wing, the first on the basal nervure, the second from the base of the radial cell, the third is apical; the two latter converge towards the lower margin.

*Hab.* Mt. Wellington, Tasmania, 2200 ft.; January to March.

The male differs in having the flagellum wholly black, the margins of the abdominal segments pale ferruginous; the second joint of the flagellum a little shorter than the third.

The colour of the wings is similar to that of *C. molestus* Sm., but the antennæ are shorter and stouter, the hind tibiæ more distinctly serrate, the position of the recurrent nervures very different, also the colour of the pubescence. The antennæ are not quite so stout and short as in *pictipennis* Sm.

## CALOPOMPILUS PROTERVUS, sp. n.

♀. Nigra, albobubescens: segmentis dorsalibus fascia apicali interrupta albopilosa; alis fuscis, cellula radiali macula apicali, cellulaque discoidali secunda striga basali flavis; segmentis analibus lateribus valde compressis; tibiis posticis basi albo-maculatis.

Long. 19 mm.

♀. Clypeus broadly subtruncate at the apex; the labrum exposed, narrowly and shallowly emarginate at the apex, a long seta springing from each of the angles of the emargination.

Antennæ fairly stout, but not short; second joint of the flagellum as long as the first and third combined, the third fully half as long again as the fourth. Eyes slightly diverging towards the clypeus; posterior ocelli a little further from the eyes than from each other. Thorax subopaque, finely aciculate; scutellum triangular, very narrowly rounded at the apex. Median segment short, opaque, with a deep median sulcus. Abdomen subopaque; first dorsal segment as broad as the second, the three apical segments strongly compressed laterally, the dorsal surface of the sixth segment almost linear; second ventral segment with a distinct, but not very strong, transverse groove near the base. Hind tibiæ spinose, the spines short; calcaria white, black at the extreme apex. Second abscissa of the radius distinctly longer than the third; first recurrent nervure received at three-fifths from the base of the second cubital cell, second at two-fifths from the base of the third cubital cell. Cubitus of the hind wing originating just before the transverse median nervure, almost interstitial.

*Hab.* Kalamunda, S.W. Australia, April.

This is somewhat allied to *C. lunatus* Sm., but is easily distinguished by the different proportions of the joints of the flagellum, by the difference in the yellow marks on the fore wings, by the more triangular scutellum, and most conspicuously by the strongly compressed anal segments.

#### Family BETHYLIDÆ.

*SIEROLA LEEUWINENSIS*, sp. n.

♀. Nigra, antennis pedibusque testaceo-ferrugineis; alis hyalinis; venis ferrugineis, basi testaceis; capite magno, latitudine duplo latiore.

Long. 3 mm.

♀. Head very large, flat, twice as long as broad, longer than the antennæ. Eyes large, oval, separated from the posterior margin of the head by a distance at least equal to their own length; ocelli situated close to the posterior margin of the head, far behind the eyes. Head, thorax, and median segment coriaceous, abdomen smooth and shining; the pronotum broader than long, a little narrowed anteriorly; mesonotum short, with a distinct longitudinal furrow on each side; a distinct transverse groove at the base of the scutellum; median segment margined at the sides, with an obscure median carina. Fore wing with a prostigma and a closed discoidal and radial cell as in other species of the genus.

*Hab.* Yallingup, S.W. Australia; December.

This is distinct from the two Australian species described by Ashmead, having a carina on the median segment and a furrow on each side of the mesonotum.

EXPLANATION OF THE PLATE.

- Fig. 1. *Zaspilothynnus wipunctatus* Turn. ♂. Apex of abdomen. Dorsal view.  
 2. " " " ♀. " " "  
 3. *Zaspilothynnus rugicollis* Turn. ♂. " " "  
 4. " " " ♀. " " "  
 5. *Pogonothynnus fulvohirtus* Turn. ♂. " " "  
 6. " " " ♀. " " "  
 7. *Lophocheilus rubrocaudatus* Turn. ♂. " " "  
 8. " " " ♀. " " "  
 9. *Encopothynnus spinulosus* Turn. ♂. Abdomen. Dorsal view.  
 10. " " " ♀. " " "  
 11. *Phymatothynnus tonsorius* Turn. ♂. Apex of abdomen. Dorsal view.  
 12. " " " ♀. " " "  
 13. *Phymatothynnus pygidiophorus* Turn. ♂. " " "  
 14. " " " ♀. " " "  
 15. *Gymnothynnus* (?) *mucronatus* Turn. ♂. " " "  
 16. " " " ♀. " " "  
 17. *Campylothynnus lundyæ* Turn. ♂. " " "  
 18. " " " ♀. " " "